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Job No.: CTCE/BBMP/W.No.15/KRIDL/GSB-1/GR/2014-15 Date : 09.10.2014

GRADATION FOR GSB-I (CLOSE GRADED)
IS: 2720 (Part 4)

Client : **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager (West),** KRIDL, Bangalore.

Name of work : Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.

Reference : BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014

Date of Testing : 09.10.2014

Sample Source : GSB Mix Plant Bangalore. **Oven Dry Wt (gm) :** 24255

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Specified Limits
75.0	0	0	0.00	0	100
53.0	915	915	3.77	96.23	80-100
26.50	5285	6200	25.56	74.44	55-90
9.50	3810	10010	41.27	58.73	35-65
4.75	3655	13665	56.34	43.66	25-55
2.36	2315	15980	65.88	34.12	20-40
0.425	4590	20570	84.81	15.19	10-25
0.075	2985	23555	97.11	2.89	3-10
PAN	700				
Total	24255				

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Remarks: Satisfies MORTH Specifications as per Table 400-1, Grading I

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Job No.: CTCE/BBMP/W.No.15/KRIDL/GSB-1/AL/2014-15 Date : 09.10.2014

ATTERBERG LIMITS TEST FOR GSB (CLOSE GRADED)
IS : 2720 (Part - 5)

Client : **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager (West),** KRIDL, Bangalore.

Name of work : Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.

Reference : BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014

Date of Testing : 09.10.2014

As per MORTH Table : 400-11

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit, %	22.00	25.0% Maximum.
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CTCE/BBMP/W.No.15/KRIDL/WMM/Gradation/2014-15

14.10.2014

GRADATION FOR WMM

MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.

Agency : **Technical Manager (West),** KRIDL, Bangalore.

Name of Work : Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.

Reference : BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014

Date of Testing : 14.10.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **24945**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	600	600	2.4	97.6	95-100
22.4	4515	5115	20.5	79.5	60-80
11.2	5890	11005	44.1	55.9	40-60
4.75	4295	15300	61.3	38.7	25-40
2.36	3580	18880	75.7	24.3	15-30
0.600	3510	22390	89.8	10.2	8-22
0.075	2245	24635	98.8	1.2	0-8

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Job No.: CTCE/BBMP/W.No.15/KRIDL/WMM/AIV/2014-15

14.10.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	14.10.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines	20.58	20.79	
	100* (W_2/W_1)%			21.08

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.15/KRIDL/WMM/S-T/2014-15 14.10.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	14.10.2014

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **12.32%**

Elongation Index = **13.28%**

Result : Combined Flakiness & Elongation index **25.60%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/W.No.15/KRIDL/BM(QB)/2014-15 22.10.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	:	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
REFERENCE	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	22.10.2014

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	64	60 to 70
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	47	Min. 45
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	302	Min. 220

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Job No: CTCE/BBMP/W.No.15/KRIDL/BM/AIV/2014-15

22.10.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	22.10.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	387	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	80	82	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	307	306	
4	Aggregate Impact value = percent fines	20.67	21.13	
	100* (W_2/W_1)%			20.90

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.15/KRIDL/BM/Shape.T/2014-15 : 22.10.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager (West),** KRIDL, Bangalore.
Name of Work	: Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	: BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminious Macadum
Date of Testing	: 22.10.2014

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Flakiness Index = **12.35%**

Elongation Index = **13.82%**

Result : Combined Flakiness & Elongation index **26.17%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.15/KRIDL/BM/Stripping/2014-15

22.10.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Type of Mix	Bituminous Macadam
Date of Testing	22.10.2014

Type of binder : 60/70

Percentage of binder used : 5.0% by wt.

Total weight of aggregate : 200 g

Total weight of binder : 10.0 g

Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.3	3.40	96.60
2	3.4		
3	3.5		

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Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Macadam is 95%

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Job No: CTCE/BBMP/W.No.15/KRIDL/BM/Sp_Wa/2014-15

22.10.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Source / Location	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	22.10.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 2	
1	Weight of aggregate suspended in water with the basket	W_1 g	2015	2016	2017	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1265	1266	1267	
4	Weight of saturated surface dry aggregate in air	W_3 g	2011	2012	2013	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	746	746	746	
6	Weight of oven dried aggregate	W_4 g	2002	2003	1996	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.684	2.685	2.676	2.680
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.716	2.718	2.738	2.727
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.45%	0.45%	0.85%	0.65%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

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Job No: CTCE/BBMP/W.No.15/KRIDL/BM/Agg.G/2014-15

22.10.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Sample ID	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	22.10.2014

Total Weight of Sample: **5100** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	380	7.45	7.45	92.55	90-100	
13.2	1690	33.14	40.59	59.41	56-88	
4.75	1485	29.12	69.71	30.29	16-36	
2.36	990	19.41	89.12	10.88	4-19	
0.3	380	7.45	96.57	3.43	2-10	
0.075	100	1.96	98.53	1.47	0-8	

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	255	4.90	4.90	95.10	90-100	
13.2	1685	32.40	37.31	62.69	56-88	
4.75	1515	29.13	66.44	33.56	16-36	
2.36	850	16.35	82.79	17.21	4-19	
0.3	410	7.88	90.67	9.33	2-10	
0.075	160	3.08	93.75	6.25	0-8	

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Job No.: CTCE/BBMP/W.No.15/KRIDL/SDBC(QB)/2014-15

23.10.2014

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

CLIENT	:	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	:	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	:	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
REFERENCE	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
SOURCE OF LOCATION	:	Hot mix Plant, Bangalore
DATE OF TESTING	:	23.10.2014

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	IS :1203 -1978 (RA-2009)	82	80 to 100
2	Softening point, ^{0}C	IS :1205 -1978 (RA-2009)	44	Min. 40
3	Ductility at 27^{0}C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, ^{0}C	IS :1209 -1978 (RA-2009)	298	Min. 220

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23.10.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.10.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	302	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.02	22.16	22.09

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.15/KRIDL/SDBC/AIV/2014-15

23.10.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.10.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	390	392	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	87	88	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	304	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.31	22.45	22.38

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Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.15/KRIDL/SDBC/Shape_T/2014-15 : 23.10.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager (West),** KRIDL, Bangalore.
Name of Work	: Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	: BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 23.10.2014

Civil-Tech Consultants & Engineers Bangalore

Result : Flakiness Index = **11.26%**

Elongation Index = **13.28%**

Result : Combined Flakiness & Elongation index **24.54%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

Note:

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Job No.: CTCE/BBMP/W.No.15/KRIDL/SDBC/Shape_T/2014-15 : 23.10.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager (West),** KRIDL, Bangalore.
Name of Work	: Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	: BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 23.10.2014

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Result : Flakiness Index = **12.50%**

Elongation Index = **13.90%**

Result : Combined Flakiness & Elongation index **26.40%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.15/KRIDL/SDBC/Stripping/2014-15

25.10.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	25.10.2014

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.4	3.50	96.50
2	3.5		
3	3.6		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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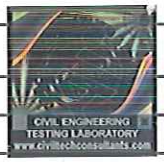
Job No.: CTCE/BBMP/W.No.15/KRIDLS/SDBC/Sp_Wa/2014-15 25.10.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	25.10.2014



Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2022	2023	2024	
2	Weight of basket suspended in water	W_2 g	755	2020	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1267	1268	1269	
4	Weight of saturated surface dry aggregate in air	W_3 g	2018	2019	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	751	751	751	
6	Weight of oven dried aggregate	W_4 g	2000	2008	2007	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.663	2.674	2.672	2.670
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.729	2.714	2.720	2.721
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.90%	0.55%	0.65%	0.70%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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25.10.2014

BITUMEN CONTENT DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

AS per IRC:SP:-1984

CLIENT	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
REFERENCE	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
SAMPLE I/D	Kalasthinagar Govt. School Ward No.15, BBMP, Bangalore.
DATE OF TESTING	25.10.2014

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted, g	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

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Job No.: CTCE/BBMP/W.No.15/KRIDL/SDBC/Bit/2014-15

25.10.2014

BITUMEN CONTENT GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager (West),** KRIDL, Bangalore.
NAME OF THE WORK	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
REFERENCE	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
SAMPLE I/D	Kalasthinagar Govt. School Ward No.15, BBMP, Bangalore.
DATE OF TESTING	25.10.2014

GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	26.36	5.55	5.55	94.45	90-100
4.75	259.6	54.65	60.20	39.80	35-51
2.36	53.12	11.18	71.39	28.61	24-39
1.18	36.32	7.65	79.03	20.97	15-30
0.3	37.25	7.84	86.87	13.13	9-19
0.075	31.22	6.57	93.45	6.55	3-8

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-15 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
13.2	0	0	0	100	100
9.5	30.22	6.38	6.38	93.62	90-100
4.75	259.6	54.77	61.14	38.86	35-51
2.36	51.22	10.81	71.95	28.05	24-39
1.18	33.12	6.99	78.94	21.06	15-30
0.3	33.26	7.02	85.95	14.05	9-19
0.075	35.21	7.43	93.38	6.62	3-8

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25.10.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	25.10.2014

Total Weight of Sample: **5100** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	330	6.5	6.47	93.53	90-100	
4.75	2515	49.3	55.78	44.22	35-51	
2.36	690	13.5	69.31	30.69	24-39	
1.18	490	9.6	78.92	21.08	15-30	
0.3	420	8.2	87.16	12.84	9-19	
0.075	355	7.0	94.12	5.88	3-8	

Total Weight of Sample: **5200** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	380	7.3	7.31	92.69	90-100	
4.75	2550	49.0	56.35	43.65	35-51	
2.36	450	8.7	65.00	35.00	24-39	
1.18	570	11.0	75.96	24.04	15-30	
0.3	390	7.5	83.46	16.54	9-19	
0.075	490	9.4	92.88	7.12	3-8	

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Job No.: CTCE/BBMP/W.No.15/KRIDL/SDBC/AGG/2014-15

25.10.2014

Aggregate Gradation Test

IS : 2386 Part I

Client	**Asst. Executive Engineer,** T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	25.10.2014

Total Weight of Sample: 5200 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	330	6.3	6.35	93.65	90-100	
4.75	2510	48.3	54.62	45.38	35-51	
2.36	665	12.8	67.40	32.60	24-39	
1.18	480	9.2	76.63	23.37	15-30	
0.3	430	8.3	84.90	15.10	9-19	
0.075	320	6.2	91.06	8.94	3-8	

Total Weight of Sample: 5250 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	345	6.6	6.57	93.43	90-100	
4.75	2560	48.8	55.33	44.67	35-51	
2.36	465	8.9	64.19	35.81	24-39	
1.18	590	11.2	75.43	24.57	15-30	
0.3	430	8.2	83.62	16.38	9-19	
0.075	485	9.2	92.86	7.14	3-8	

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Note:

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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
ಟಿ.ದಾಸರಹಳ್ಳಿ ಉಪ-ವಿಭಾಗ
ಬಾಗಲಗುಂಟೆ, ಬಿಬಿಎಂಪಿ
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Building & Highway Material Testing Laboratory

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JAS-ANZ BSCIC ISO 9001 REGISTERED

Job No.: CTCE/BBMP/W.No.15/KRIDL/SDBC/Stability/2014-15 25.10.2014

TEST REPORT ON STABILITY OF MIX

Client	:	**Asst. Executive Engineer**, T. Dasarahalli Sub Division, BBMP, Bangalore.
Agency	:	**Technical Manager** (West), KRIDL, Bangalore.
Name of the Work	:	Improvements & Asphalting to Kalasthinagar Govt. School Road and right side area in Dasarahalli in Ward No.15, BBMP, Bangalore.
Reference	:	BBMP/DZ/AEE/TDSD/PR/2014-15 Dated: 06.10.2014
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Semi Dense Bituminous Concrete
Date of Testing	:	25.10.2014

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, Kn	8.70	8.60	8.2 Kn (min)
2	Marshal flow, mm	3.15	3.30	2 – 4
3	Percent air voids in Mineral Aggregate	3.90	4.10	3 – 5
4	Voids in Compacted Mix	13.80	14.10	13 – 15
5	Percent Voids filled with Bitumen	65.25	66.30	65 - 78
6	Density, g/cc	2.26	2.27	--

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Type of Mix	:	Semi Dense Bituminous Concrete
Date of Testing	:	25.10.2014

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, Kn	8.30	8.25	8.2 Kn (min)
2	Marshal flow, mm	3.20	3.40	2 – 4
3	Percent air voids in Mineral Aggregate	4.30	4.40	3 – 5
4	Voids in Compacted Mix	13.60	13.70	13 – 15
5	Percent Voids filled with Bitumen	66.35	67.25	65 - 78
6	Density, g/cc	2.26	2.27	--

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